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10/599,027

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Liwen Zhang

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GLOBAL IP SERVICES

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EXAMINER

HAMMER, KATIE L

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/599,027 | Applicant(s) ZHANG, LIWEN | |
| | Examiner KATIE HAMMER | Art Unit 1761 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4,5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4,5 and 7-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to Applicant's Remarks filed on November 18, 2010. Claims 4-5 and 7-20 are pending for examination. Claims 4-5, 7 are currently amended. Claims 18-20 are newly added.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 18, 2010 has been entered.

Claim Objections

3. Claims 18-20 are objected to because of the following informalities: "The yarn of animal collagen fiber of claim 4 (or 18, respectively)" is unclear because claim 4 is to a process for manufacturing this yarn. It is suggested that the claims read "The yarn of animal collagen fibers manufactured by the process of claim 4 (or 18, respectively)." Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 8-9, 11 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "textile fibers" in the phrase "is used for blending the collagen fibers and textile fibers". Claim 9 recites the limitation "bunchy collagen fibers and textile fibers". Claim 11 recites the limitation "textile fibers" in the phrase "to twist the collagen fibers and textile fibers to form yarns." There is insufficient antecedent basis for this limitation in the claims, as textile fibers are not claimed in claim 4 as currently amended.

Instant claim 18 claims that the yarn comprises 1-**100** wt% of dispersing collagen fibers and **0**-99 wt% of textile fiber, which indicates that the yarn may entirely consist of the dispersing collagen fibers (100 wt%). However, claim 18 further claims that said collagen fiber and textile fiber are spun together and twisted as blended fibers. The collagen fiber and textile fiber cannot be spun together if the composition contains 0 wt% of textile fiber, therefore the claim is indefinite. Appropriate correction is required.

The words "appear bunchy" and "several thinner bunchy" in claim 18 are not clearly defined in the instant claim or in the specification as filed. The term "thinner" is a relative term. Clarification of this term is required.

The amendment to claim 18 is generally narrative and indefinite, failing to conform with current U.S. practice. It appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096).

As to claim 4, Steffan teaches a process for manufacturing yarn of animal collagen fiber, comprising the following steps: choosing tanned leather materials, loosing fibers, assorting, blending, carding, drawing and twisting, wherein an opener is used to loose fibers (tendons from calf treated with an alkali treatment, transferred into a tanning drum, fibers are separated, treatment with tanning agent, fibers dissociated on a carding machine, fiber bands are stretched and twisted, chemical treatment opener is used to loose the fibers (see col. 4, line 43 to col. 5, line 57).

Steffan fails to teach or disclose the process wherein the fibers are loosened by a reciprocating liquid opener which has a container and at least a beater and liquid.

However, Sakashita et al. teaches the process wherein the fibers are loosened by a reciprocating liquid opener having a container and at least a beater, liquid includes water and at least one substance being added to the water selected from 0.2-2 percent (by weight of water) washing agent, 1-20 percent (by weight of water) lipid or product thereof, 0.2-1.5 percent (by weight of water) penetrating agent and 0.3-0.5 percent (by

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weight of water) basic substances; the liquid makes the tanned leather materials expanding; the beater makes adhesive substances of fiber matrix among the collagen fibers to become lubricating agent again under repeating beating the tanned leather (desirable to remove the impurities such as lipids of collagen by applying a treatment widely employed for treating hides, for example the raw hide is dipped in lime water to loosen the collagen structure, then followed by an acid-alkali treatment, an enzyme treatment, or a solvent treatment, see col 3, lines 54-65).

Therefore, in view of the teaching of Sakashita et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan by incorporating the process for loosening fibers as taught by Sakashita et al. to arrive at the claimed invention because Steffan teaches the original, rather compact fibers of the tendons or hides are loosened (see col. 2, lines 63-68). Sakashita et al. clearly teaches the use of the claimed loosening process, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success for removing impurities present in the insoluble collage (see Sakashita et al., col. 3, lines 54-65) and would expect such a process to have similar properties to those claimed, absent unexpected results.

As to claims 9 and 11, Steffan teaches tanning agents employed in the leather industry, see col. 3, line 37 to col. 4, line 13); the process wherein in the carding step a carding machine to make the bunched collagen fibers and textile fibers form continuous fiber assemble with a particular linear density which is homogeneously blended and

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arrayed orderly in longitudinal direction (fibers dissociated on a carding machine, see col. 5, lines 24-40); the process of claim 4 wherein in the twisting according to diameter and length of the collagen fibers and requirements of spinning yarns select correct roller, abrasion, ring spindle and process for spinning yarns to twist the collagen fibers and textile fibers to form yarns (preyarn is stretched and twisted on condensing ring spinning frame, the number of yarn twists depends mostly on the intended yarn strength and fiber length, see col. 5, lines 48-57).

6. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096), further in view of Fujii et al. (US 3,314,861).

Steffan and Sakashita et al. teach a process for manufacturing yarn of collagen fiber as described above, but fails to teach or disclose the use of acid protease and the pH value in the solution being controlled between 3 and 6.

As to claim 5, Fujii et al. teaches a process for manufacturing the yarn of animal collagen fiber, wherein acid protease is used for deliming, and the pH value in the solution is controlled between 3 and 6 (insoluble collagen of calf skin could be digested with the common proteolytic enzymes under acid conditions to generate collagen fibers, see col. 2, lines 32-40; adjusted to pH of 6.2, see Examples 2, 3, 8; pH of 3.0 in Example 14; collagen solution formed can used to prepare yarns or textiles, see col. 7, lines 46-48).

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Therefore, in view of the teaching of Fujii et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing a yarn of collagen fibers as taught by Steffan and Sakshita et al. by incorporating the use of the acid protease and pH range as taught by Fujii et al. to arrive at the claimed invention because Steffan teaches that some of the individual steps are part of a common knowledge and the fibers are subjected with ease to further textile processing (see Steffan col. 4, lines 23-34). Fujii et al. clearly teaches the use of the claimed acid protease and pH range for collagen fiber preparation, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success for solubilizing insoluble collagen (see Fujii et al., col. 2, lines 32-34), and would expect such a process to have similar properties to those claimed, absent unexpected results.

As to claim 13, Steffan teaches the process wherein for the washing step saponified mixtures are cleaned by ambient water at 30-40 centigrade, followed by washing with ambient water one to two times to make the pH value between 6.5-8 (warm aqueous solution of sodium bicarbonate at a temperature of 40 degrees Celsius and subsequently washed with water for 30 minutes, see Example 1, lines 56-60).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096), further in view of Ueda et al. (US 2004/0073010 A1).

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Steffan in view of Sakashita et al. teach a process for manufacturing the yarn of collagen fiber as described above in the rejection for instant claim 4, but fails to teach or disclose the loosened collagen fibers separated by wind.

As to claim 7, Ueda et al. teaches the process wherein the assorting has steps including first the loosened dispersing collagen fibers are separated by wind, longer fibers are distributed into a different zone from that of the shorter fibers by the function of airflow, second assorting according to the length of the fibers (winding collagen fiber around a pipe or bar, see para. 0072).

Therefore, in view of the teaching of Ueda et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan and Sakashita et al. by incorporating the process for the winding as taught by Ueda et al. to arrive at the claimed invention because Steffan teaches treatment of hides in the manner of the leather industry (see col. 5, lines 60-63). Ueda et al. clearly teaches the use of the claimed winding process, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success and would expect such a process to have similar properties to those claimed, absent unexpected results.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096), further in view of Okamura (US 3,616,169).

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Steffan in view of Sakashita et al. teach the process for manufacturing yarn of animal collagen fiber as described above in regards to claim 4, however fails to disclose that in the blend step a multi-layer cotton mixing machine is used for blending the collagen fibers and textile fibers.

As to claim 8, Okamura teaches the process of claim 4 wherein in the blend step a multi-layer cotton mixing machine is used for blending the collagen fibers and textile fibers (blend of the chromed collage fiber formed into nonoriented web by treatment successively with a land feeder and a land webber, see Okamura col. 3, line 73 to col. 4, line 7).

Therefore, in view of the teaching of Okamura, one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan and Sakashita et al. by incorporating the blend step as taught by Okamura to arrive at the claimed invention because Steffan teaches that some of the individual steps are part of a common knowledge and the fibers are subjected with ease to further textile processing (see Steffan col. 4, lines 23-34). Okamura clearly teaches the use of the claimed blending step, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success and would expect such a process to have similar properties to those claimed, absent unexpected results.

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9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096), further in view of Foster et al. (US 2002/0104305 A1).

Steffan in view of Sakashita et al. teach a process for manufacturing yarn of collagen fiber as described above in regards to claim 4, but fails to teach or disclose the use of a drawing machine.

As to claim 10, Foster et al., in analogous art of a method of processing textile materials, teaches the process wherein in the drawing step, a drawing machine is used to drawn and level fibers one to three times, each fiber is continuously extended to achieve the object for improving the uniformity of the fibers (stable twisting and drawing machine shown in Figure 26, see para. 0068; the yarn may be drawn prior to being cooled and twisted, see para. 0010 and 0012; heated yarn is drawn, see para. 0054).

Therefore, in view of the teaching of Foster et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan and Sakashita et al. by incorporating the use of a drawing machine taught by Foster et al. to arrive at the claimed invention because Steffan teaches the stretching and twisting of the collagen fibers on a spinning frame apparatus (see Steffan col. 5, lines 45-49). Foster et al. clearly teaches the use of the claimed drawing machine, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success for

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stretching and twisting the fibers and would expect such a process to have similar properties to those claimed, absent unexpected results.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan et al. (US 4,404,033) in view of Sakashita et al. (US 6,160,096) and Fujii et al. (US 3,314,861), further in view of Kunovice et al. (US 3,607,609).

Steffan et al. in view of Sakashita et al. and Fujii et al. teach a process for manufacturing yarn of collagen fiber as described above in the rejection for instant claim 5, but fails to teach or disclose the detailed procedure of the liming step.

As to claim 12, Kunovice et al. teaches the process wherein the liming step uses calcium hydroxide as the primary ingredient, adding 1-3 percent (weight of rawhide) sodium sulfate and 0.1-0.5 percent sodium hydroxide, water is 1.5-2 times that of the rawhide, the temperature for the liming solution is at 30-50 centigrade, and the time for soaking is 2-24 hours (see Example 2; it is noted that one of ordinary skill in the art could optimize the percentages and time period for soaking by routine experimentation, burden shifted to applicant to prove that the claimed ranges produce a new and unexpected result, and do not just differ in degree from the prior art results, see MPEP 2144.05).

Therefore, in view of the teaching of Kunovice et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan, Sakashita et al. and Fujii et al. by incorporating the process for the liming step as taught by Kunovice et al. to

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arrive at the claimed invention because Steffan teaches any liming step in the manner of the leather industry (see col. 5, lines 60-63). Kunovice et al. clearly teaches the use of the claimed liming process, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success and would expect such a process to have similar properties to those claimed, absent unexpected results.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096) and Fujii et al. (US 3,314,861), further in view of Ueda et al. (US 2004/0073010 A1).

Steffan in view of Sakashita et al. and Fujii et al. teach a process for manufacturing the yarn of collagen fiber as described above in the rejection for instant claim 5, but fails to teach or disclose the detailed procedure of the deliming step.

As to claim 14, Ueda et al. teaches the process wherein for the deliming step, adding 2-3 percent (by weight of the hide) ammonium sulfate, 0.2-0.5 percent protease and 1-2 times of water, soaking alternated with rolling at pH value between 3 and 6, and at the temperature between 35 and 40 centigrade for 1-2 hours by removing basic ions in hide and simultaneously further hydrolyze the fiber matrix of rawhide, fat, and non-fiber protein, then the impurities are removed with water, for the hide with furs 3-4 percent (by weight of hide) alkali sulphide including 10-15 percent lime paste, 1-2 percent sodium hydroxide and 1-2 times of water, is added before liming, the furs are taken off from the hide when dipping for 2-16 hours, and then removed by washing

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(ammonium sulfate with adjusted pH to obtain the desired collagen fiber, see para. 0025; sodium hydroxide used to raise the pH to swell the fibers, see para. 0034 and 0047; conventional leather treatments with fibers soaked in lime and enzyme treatment, see para. 0018; it is noted that the order of steps and reaction conditions could be optimized and arrived at by one of ordinary skill in the art).

Therefore, in view of the teaching of Ueda et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan, Sakashita et al. and Fujii et al. by incorporating the process for the deliming step as taught by Ueda et al. to arrive at the claimed invention because Steffan teaches treatment of hides in the manner of the leather industry (see col. 5, lines 60-63). Ueda et al. clearly teaches the use of the claimed deliming process, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success and would expect such a process to have similar properties to those claimed, absent unexpected results.

12. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096) and Fujii et al. (US 3,314,861), further in view of Bartlett (US 4,147,511).

Steffan, Sakashita et al. and Fujii et al. teach a process for manufacturing the yarn of collagen fiber as described above in the rejection for instant claim 5, but fail to

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teach or disclose the details of the tanning and softening step or use of the wringing machine.

As to claims 15-16, Bartlett suggests the process of claim 5 wherein in the tanning and softening step, method of chrome tanning or plant tanning or organic tanning or mineral tanning is performed in the opener to make the hide be torn to and fro while tanning, so that the collagen fibers are basically loosened, after tanned, the resulting loosened collagen fibers are softened by emulsifiable solution and lipid to prevent from cohesion after dehydration (tanning of leather by chrome tanning methods, then subjected to a fatliquoring process where they are lubricated so they remain pliable after being dried, see col. 1, lines 30-45); the process wherein a wringing machine is used to make water content between 20-30 percent (hides are wrung by machine to remove excess moisture, see col. 1, lines 35-36; one can process hides to almost any degree of wetness which is desired, see col. 2, lines 50-57).

Therefore, in view of the teaching of Bartlett, one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan, Sakshita et al. and Fujii et al. by incorporating the process for the tanning and softening step and the wringing machine to arrive at the claimed invention because Steffan teaches the use of several tanning agents and the removal of fluid from the collagen fibers (see col. 3, lines 41-68). Bartlett clearly teaches the use of the tanning and softening process, as well as the wringing machine, and, thus, a person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a

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reasonable expectation of success for retaining the softness of the collagen fibers and removing excess moisture and would expect such a process to have similar properties to those claimed, absent unexpected results.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) in view of Sakashita et al. (US 6,160,096) and Fujii et al. (US 3,314,861), further in view of Heany (US 1,585,613).

Steffan, Sakashita et al., and Fujii et al. teach a process for manufacturing the yarn of collagen fiber as described above in the rejection for instant claim 5, but fails to teach or disclose that the loosening fibers step uses a trapeziform opener or a gill box rotary opener or a cutting machine with three cylinders.

Heany teaches the use of cutting machines to loosen the fibers used for manufacturing yarns (see page 3, lines 4-24). It is noted that the number of cylinders found in the cutting machine could be chosen by one of ordinary skill in the art based upon the loosening results for the fibers. Burden is shifted to the applicant to prove the criticality of the three cylinders to show unexpected results.

Therefore, in view of the teaching of Heany, one having ordinary skill in the art at the time the invention was made would be motivated to modify the process for manufacturing the yarn of collagen fibers as taught by Steffan, Sakashita et al. and Fujii et al. by incorporating the process for loosening fibers using a cutting machine because Steffan et al. teaches dissociating and untangling the collagen into individual fibers (see col. 5, lines 42-45). Heany clearly teaches the use of the cutting machine, and, thus, a

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person of ordinary skill in the art would be motivated to select the instantly claimed process for manufacturing the yarn of collagen fiber with a reasonable expectation of success for loosening the collagen fibers and would expect such a process to have similar properties to those claimed, absent unexpected results.

14. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffan (US 4,404,033) and Sakashita et al. (US 6,160,096), in view of Okamura (US 3,616,169) and Garner et al. (US 3,255,580).

Steffan and Sakashita et al. teach the process for manufacturing yarn of animal collagen fiber as described above in regards to claim 4, however fail to disclose that the yarn of animal collagen fiber comprises 1-100 wt% of dispersing collagen fibers derived from leathers and/or animal skins, and 0-99 wt% of textile fiber, said collagen fiber and textile fiber being spun together.

However, as to claim 18, Okamura teaches a kind of yarn of animal collagen fiber, comprising 1-100 wt% of dispersing collagen fibers derived from leathers and/or animal skins, and 0-99 wt% of textile fiber, said collagen fiber and textile fiber being spun together (chromed collagen fibers obtained by chemical or physical treatment of the derm or true skin of natural leather, see col. 1, lines 44-49; yarn which has been spun and twisted from a fibrous mixture of cotton and chromed collagen fiber, see col. 5, lines 9-11), and the yarn of animal collagen fiber is able to be woven for textile products (see col. 1, lines 54-60 and Example 2, manufacturing articles of nonwoven fabrics).

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Okamura fails to explicitly disclose that in the yarn of the animal collagen fiber the collagen fibers appear bunched and several thinner bunched collagen fibers, which incorporate other textile fibers or other collagen fibers to form a kind of continuous blended fiber bundles, which are twisted as a blended fibers.

However, Garner et al., in analogous art of blended yarns used in the production of textiles, teaches combinations of continuous filament yarns, spun yarn, or combinations thereof, in desired proportions to enable the resultant blend of yarn to become extremely bulky and voluminous when the blend of yarn or subsequent fabric is in its end form (see col. 1, lines 26-33, col. 1, lines 57-68 and col. 3, lines 10-21).

Therefore, in view of the teaching of Garner et al., one having ordinary skill in the art at the time the invention was made would be motivated to modify the kind of yarn of animal collagen fiber as taught by Steffan, Sakashita et al, and Okamura by incorporating the continuous blended fiber bundles taught by Garner et al. to arrive at the claimed invention because Okamura suggests yarn blends of the cotton or nylon and collagen fibers (see Examples 3 and 4). Garner et al. clearly teaches that it is known in yarn processing of mixed fibers to form a kind of continuous blended fiber bundles (see col. 6, lines 61-73), and, thus a person of ordinary skill in the art would be motivated to select the instantly claimed yarn with a reasonable expectation of success for arriving at a yarn of continuous blended fiber bundles (col. 3, lines 10-21), and would expect such a product to have similar properties to those claimed, absent unexpected results.

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As to claims 19-20, Okamura teaches the yarn wherein the collagen fiber is derived from at least one kind of animals including cattle, sheep, horses, dogs, pigs, deer, rabbits, crocodiles and snakes (chromed collagen fibers obtained by chemical or physical treatment of the derm or true skin of natural leather, see col. 1, lines 44-49; it is noted that natural leather must be derived from at least one kind of animal); the yarn of animal collagen fiber wherein the textile fiber is at least one of natural fibers and synthetic fibers including cotton, hemp, wool, silk, terylene, acrylic, nylon, polyamide, and viscose staple (nylon twisted with chromed collagen fiber, see Example 3; cotton twisted with chromed collagen fiber, see Example 4).

Response to Arguments

15. Applicant's arguments with respect to claims 4-5 and 7-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KATIE HAMMER whose telephone number is (571)270-7342. The examiner can normally be reached on Monday to Friday, 10:00am EST to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harold Y Pyon/
Supervisory Patent Examiner, Art
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/KLH/
Katie L. Hammer
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April 28, 2011